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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,382	09/05/2003	Eiji Hashimoto	APW-022	8525
959	7590	08/12/2005	EXAMINER	
LAHIVE & COCKFIELD, LLP. 28 STATE STREET BOSTON, MA 02109			CHANG, SUNRAY	
			ART UNIT	PAPER NUMBER
			2121	

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/656,382

Applicant(s)

EIJI ET AL.

Examiner

Sunray Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 September 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 20030905, 20050428.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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**DETAILED ACTION**

1. Claims 1 – 20 are presented for examination.

Claims 1 – 20 are rejected.

**Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. **Claims 1 – 20 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Yuji Yasui et al. (U.S. P.G. Pub. No. 2003/0009240 and referred to as **Yasui** hereinafter), and in view of Masafumi Iwashiro (U.S. Patent No. 6,680,812 and referred to as **Iwashiro** hereinafter).

(Yasui as set forth above generally discloses the basic inventions.)

**Regarding independent claims 1 and 8,**

**Yasui** teaches,

- A control system for a plant, [Abstract, and 0006] including
- a controller for controlling said plant based on a controlled object model which is obtained by modeling said plant, [0006]
- said controlled object model being modeled using an input and an output of said plant which are sampled, [0013] and
- the sampled input of said plant being a filtered control output [if the identifying error is in the predetermined range, 0014, 0084] which is obtained by filtering an output of said controller [identifying error calculating means performs a low-pass filtering, 0018], [see also 0013 – 1108] wherein
- said controller carries out a control process of said plant at intervals of the control period.  
[the control process by the adaptive sliding mode controller, 0084 and 0159]

**Yasui** does not teach intervals of a sampling period, which is longer than a control period of said controller.

**Iwashiro** teaches intervals of a sampling period, which is longer than a control period of said controller [performs control in a shorter time than the sampling period, it is more liable to permit a larger control value to occur, Col. 9, Lines 30 – 36] for the purpose of more liable to permit a larger control value to occur.

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Yasui** to include "intervals of a sampling period,

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which is longer than a control period of said controller” for the purpose of more liable to permit a larger control value to occur.

**Regarding dependent claims 2, 9 and 16,**

**Yasui teaches,**

A control system according to claim 1, wherein

- said controller performs a feedback control [feedback controller, 0329] of calculating the output of said controller to make the output of said plant coincide with a target value, [see 0082, 0256 and 0326 – 0329 and Fig. 42]
- said controller being capable of specifying a damping characteristic of a deviation [0092] between the output of said plant and the target value. [e(k), 0089] [see also 0089 – 0092]

**Regarding dependent claims 3, 10 and 17,**

**Yasui teaches,**

A control system according to claim 2, wherein

- said controller is a sliding mode controller. [Abstract]

**Regarding dependent claims 4, 11 and 18,**

**Yasui teaches,**

A control system according to claim 3, wherein

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- said sliding mode controller calculates a value of a switching function defined as a linear function of the deviation between the output of said plant and the target value, [0091, see also 0089 – 0092] and
- a sampling time interval of the deviation which is used to calculate the value of the switching function is equal to the sampling period. [0101 – 0104 and Eq. 7 – 11]

**Regarding dependent claims 5, 12 and 19,**

**Yasui teaches,**

A control system according to claim 1, further including

- an identifier for identifying at least one model parameter of the controlled object model, [Abstract] wherein
- said controller calculates the output of said controller using the at least one model parameter identified by said identifier, [Abstract] and
- said identifier identifies the at least one model parameter [Abstract] at intervals of the sampling period, using the filtered output of said controller. [0083 – 0104]

**Regarding dependent claims 6, 13 and 20,**

**Yasui teaches,**

A control system according to claim 1, wherein

- said plant includes a throttle valve of an internal combustion engine and a throttle valve actuating device having an actuator for actuating said throttle valve, [0022] and

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- said controller calculates a parameter for determining a control input to be applied to said throttle valve actuating device to make an opening of said throttle valve coincide with a target opening. [0022]

**Regarding independent claims 7, 14 and 15,**

**Yasui** teaches,

- A control system for a plant, [Abstract] comprising:
- an identifier for identifying at least one model parameter of a controlled object model [Abstract] which is obtained by modeling said plant [0013, 0321 and claim 1 of **Yasui**];
- a controller for controlling said plant using the at least one model parameter identified by said identifier, [Abstract]
- said controller carrying out a control process of said plant at intervals of a control period; [0103 – 0104, see also 0084 – 0104] and
- a filter for filtering an output of said controller, [0018, see also 0013 – 0018] wherein said
- controlled object model is modeled using an input and an output of said plant [0013] which are sampled [identified, 0013] and
- said identifier identifies the at least one model parameter [Abstract] based on an output of said filter and the output of said plant. [0018]

**Yasui** does not teach intervals of a sampling period, which is longer than a control period of said controller.

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**Iwashiro** teaches intervals of a sampling period, which is longer than a control period of said controller [performs control in a shorter time than the sampling period, it is more liable to permit a larger control value to occur, Col. 9, Lines 30 – 36] for the purpose of more liable to permit a larger control value to occur.

It would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of **Yasui** to include "intervals of a sampling period, which is longer than a control period of said controller" for the purpose of more liable to permit a larger control value to occur.

### **Conclusion**

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **Yasui et al.** (U.S. P.G. Pub. No. 2003/0028264) discloses a control system for plant, a sliding mode controller, a switching function, a control target value, an output of the plant, and an amount of change in the output of the plant. **William Albert Gordon Gough, Jr.** (U.S. Patent No. 5,687,077) discloses a method and apparatus for adaptive control which **does NOT** require a predetermined model of the process to be controlled.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Sunray Chang** whose telephone number is (571) 272-3682. The examiner can normally be reached on M-F 7:00-4:30.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-746-3506.

Sunray Chang  
Patent Examiner  
Group Art Unit 2121  
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U.S. Patent and Trademark Office



**Anthony Knight**  
**Supervisory Patent Examiner**  
**Group 3600**

August 8, 2005